

**Fig. 4:** DNA sequence comparison of the wild type "gag" gene (Seq.ID2) against the codon-optimized "gag" gene (Seq.ID5).

SeqID2	1	ATGGGCCAAACTATAACTACCCCTTGAGCCTCACCCCTCAACCACTGGTCTGAGGTTACG
SeqID5	1	#####G"C"C"C"C#####C#####G#####AGC#####G"
SeqID2	61	GCACGGGCCCGTAATCAGGGTGTGCAAGTCCGAAAAAGAAATGGATTACACTGTGTGAA
SeqID5	61	"CA#####A"G"C#####C"G"G"G"GA####G#####G#####C"C#####C"G
SeqID2	121	GCCGAATGGGTAAATGATGAATGTAGGTTGGCCCCGAGAAGGAACCTTACCATTGACAACT
SeqID5	121	#####G#####C"G"C#####A"G"G"C"C#####C#####C
SeqID2	181	ATTTCACAGGTCGAGGAGAGAATCTTCGCCCGGGGCCATATGGACACCCAGATCAAATC
SeqID5	181	"CAGC#####G#####G#####C"C"C"C"C"C#####C"C"G"#####C"#####G"
SeqID2	241	CCTTATATTACCACTGGAGATCCCTAGCCACAGACCCCTCCATGGGTTTCGCCCATTC
SeqID5	241	"C"C"C"C#####C#####GAG"#####G#####C"C#####GA"G"C"#####C"
SeqID2	301	CTACCCCTCCTTAAGCATCCAGGACAGATCCTCCGAGCCTCTTTCGCGCAACCTCTT
SeqID5	301	"G#####C"C"C#####C#####C"C"C#####C"GAGC"#####C"G
SeqID2	361	GCGCCGCAACCC_TC_TTCCCCCA_CCCCGCTCTACCCCGTTCTCCCAAAACAGAC
SeqID5	361	"C"C"C"G"#####AG"GCC"#####T"AG"AG"#####G#####G"#####C"#####G"
SeqID2	418	CCCCCAAGGGCGCTGTATTACCACCAATCCTTCTTCCCTTTAATTGATCTCTTAACA
SeqID5	421	#####C"C"C"G"C"G"#####C#####CAGCAG"#####C"G"C"#####C"G"C"#####C"
SeqID2	478	GAAGAGCCACTCCCTATCTCGGGGTACGGGCCAACACCGCGTCAGGCCCTAGAACCC
SeqID5	481	"G#####C"C"C#####C"C"C"C#####C"C"C"C#####C"#####C"#####G"
SeqID2	538	CCAAGTGCCTCCCGATTGCCATCCGGCTGCGAGAACGACGAGAAAACTCAGCTGAGAAA
SeqID5	541	"C"C"C"#####AG"#####C"C"C#####A"G"#####A"G"#####C"#####G"#####G"
SeqID2	598	TCTCAAGCCCTCCCTTAAGGGAAGACCCAAACACAGACCCCACTAGGCCATTCTCG
SeqID5	601	AGC"#####G"#####C"G"#####G#####G#####G#####C"#####AGC
SeqID2	658	GCCTCTGACCTGTACAAATTGGAATTCATAA_CCCCCCTTTCTCCAGGACCCAGTGGC
SeqID5	661	"AGC"#####C"#####GC"#####C"C"#####_AG"#####C"#####G"
SeqID2	717	CCTAACTAAACCTAATTGAGTCCATTTTAGTGACACATCAGCCAACTGGGACGACTGCCA
SeqID5	720	"C"#####G"C"#####AG"#####C"G"#####C"C"#####C"#####G"#####G"
SeqID2	777	ACAGCTCTTACAGGCTCTCTGACGGCAGAGGAGAGACAAAGGTCCTCCTTGAAGCCCG
SeqID5	780	G"#####GC"G"#####C"G"#####C"C"#####G"G"#####G"#####G"#####G"#####A"
SeqID2	837	AAGCAAGTTCCAGGCGAGGACGACGGCCAAACCCAGCTGCCCCAATGTCGTGACGAGGC
SeqID5	840	G"#####G"#####C"#####CA"#####C"#####C"#####C"#####G"#####G"#####G"
SeqID2	897	TTTCCCTTGACCCGTCCTCAACTGGGATTTTGTATGCGCGGCAGGTAGGGAGCACCTACG
SeqID5	900	"C"#####C"#####A"G"#####C"#####C"#####C"#####C"#####C"#####G"#####G"
SeqID2	957	CCTTTATGCGCAGTTGCTGTTAGCGGGCTCGCGGGGCTGCAAGACGCCCCACTAATTT
SeqID5	960	G"G"#####CA"G"#####C"#####C"G"#####C"C"#####GA"G"#####C"#####C"#####C"#####C"
SeqID2	1017	GGCACAGGTAAAGCAAGTTGTACAGGGAAAGAGGAAACGCCACCTCATTCTTAGAAAG
SeqID5	1020	"C"#####G"#####G"#####G"#####G"#####C"G"#####G"#####A"#####C"#####AGC"#####C"G"#####G"
SeqID2	1077	ATTAAAGAGGGCTTACAGAAATGTATATCCCTATGACCTTGAGGACCCAGGGCAGGCTGC
SeqID5	1080	GC"G"#####G"#####C"#####G"#####C"#####C"#####C"#####C"#####C"#####C"#####CA"
SeqID2	1137	TAGTGTATCTGTCCTTTATCTACCACTCTAGCCCGGACATAGAAATAAGTTACAAAG
SeqID5	1140	C"C"C"G"#####AG"#####C"#####AGC"#####C"#####C"#####G"#####C"#####C"#####G"#####G"

SeqID2	1197	GCTAGAAGGCCTACAGGGGTTCACTGTCTGATTGCTAAAAGAGGCAGAAAAGATATA
SeqID5	1200	""G""G""""G""""C""""C""AGC""CC""G""G""""C""G""""C""
SeqID2	1257	CAACAAAAGGGAAACCCAGAGGAAAGGGAAGAAAGATTATGGCAGCGGCAGGAAGAAAG
SeqID5	1260	""""G""""G""A""C""""G""""G""G""G""C""G""""A""""G""G""
SeqID2	1317	AGATAAAAAGCGCCATAAGGAGATGACTAAAGTCTGGCCACAGTAGTTGCTCAGAATAG
SeqID5	1320	G""C""G""A""G""C""""""""C""G""G""""C""G""G""C""""C""
SeqID2	1377	AGATAAGGATAGAGGGGAAAGTAAACTGGGAGATCAAAGGAAAATACCTCTGGGGAAGA
SeqID5	1380	G""C""""C""G""C""G""C""G""C""G""C""G""G""G""G""C""C""C""C""G""
SeqID2	1437	CCAGTGTGCTTATTGCAAGGAAAAGGGACATTGGGTTGCGGATTGCCCGAAACGACCCCG
SeqID5	1440	""""C""""C""""G""""C""""C""""C""G""G""G""G""G""C""G""C""G""G""C""
SeqID2	1497	GAAGAAACCGCCAACTCCACTCTCCTCTAA
SeqID5	1500	""""G""""""A""G""C""G""G""G""

Fig. 5

DNA sequence comparison of the wild type „env“ (gp70 region from Seq.ID1) against the codon- and signal optimized „env“ gene (gp70; Seq.ID8).

SeqID11	1	ATGGAAAGTCCAAACGACCCAAAACCCCTCTAAAGATAAGACTCTCTCGTGGAACTTAGCG
SeqID8	1	*****TCC**C**C*****C**G*****C**G**C*****A**G**T**
SeqID11	61	TTTCTGGTGGGGATCTTATTACAATAGACATAGGAAATGGCCAATCCTAGTCCACACCAA
SeqID8	61	**C*****C**C**G**C**C**T*****C*****C**CTC**C**C**GG
SeqID11	121	ATATATAATGTAACTTGGGTAAATACCAATGTACAAACTAACACCCAGCTAACGCCACC
SeqID8	121	**C**C*****G**C*****G**C*****G**G**C*****G**C**T*****G
SeqID11	181	TCTATTGTAGGAACCTTAACCGATGCCTACCTACCTACATGTTGACTTATGTGACCTA
SeqID8	181	*****C**G**C**G**A*****A*****C*****G*****G**C**G*****G
SeqID11	241	GTGGGAGACACCTGGGAACCTATAGTCTTAAACCCAAACCAATGTAAACACGGGGCAGCT
SeqID8	241	*****G*****G**C**TCCG**G*****C*****G**G**C*****CA**G
SeqID11	301	TACTCCTCTCAAATATGGATGTAAACTACAGATAGAAAAACAGCAACAGACATAC
SeqID8	301	*****C**G*****C**C**G**C*****C**G**G**G**G*****G*****G
SeqID11	361	CCCTTTTACGTCTGCCCGGACATGCCCCCTCGTTGGGGCCAAAGGGAACACATTGTGGA
SeqID8	361	*****T**G*****T**C*****C*****C*****C*****C**C**G*****G
SeqID11	421	GGGCGACAAGATGGGTTTGTGCGCATGGGATGTGAGACCAACCGGAGAAGCTTGTGTGG
SeqID8	421	*****C**G*****C**C*****T**C*****C*****A*****A**G**C*****
SeqID11	481	AAGCCCACTCCTCATGGGACTATATCAGTAAAGAGGGAGTAGTCAGGACAATAGC
SeqID8	481	*****C*****C*****G**G**G**C**CTCCTC*****CTC**
SeqID11	541	TGTGAGGGAAATGCAACCCCTGGTTTGTGCAAGTTCACCCAGAAGGGAAGACAAGCCTCT
SeqID8	541	*****C**G*****G*****G*****C*****C*****C*****G**G**C*****C
SeqID11	601	TGGGACGGACCTAAGATGTGGGGATTGCGACTATACCGTACAGGATATGACCTATCGCT
SeqID8	601	*****T**C**C*****CC**A**G**G**A*****C*****C*****T**C
SeqID11	661	TTATTACGGTGTCTCCGGCAGGTATCAACCAATTACGCCGCTCAGGCAATGGGACCAAC
SeqID8	661	**C**G*****A*****A*****G**C*****C**C**C**C*****C*****C**
SeqID11	721	CTAGTCTTACCTGATCAAAAACCCCATCCCGCAATCTCAAACAGGGTCCAAAGTGGCG
SeqID8	721	**G**G**G**G*****C**G**G**G*****C**A**G**G*****C**G**G*****C
SeqID11	781	ACCCAGAGGCCCAACGAATGAAAGCGCCCCAGGTCGTGTGCCCCACCACTGGGT
SeqID8	781	*****G*****G**C*****GTCT*****C*****G*****G*****C
SeqID11	841	CCCAACCGGATTGGGACCGGAGATAGGTAAATAAATTTAGTACAAGGGACATACCTAGCC
SeqID8	841	*****GA*****C**A**G**C**C**G**C**C**G**G**G**C**C*****G**
SeqID11	901	TTAAATGCCACCGACCCCAACAAACTAAAGACTGTTGGCTCTGCTGTGTTTCTCGACCA
SeqID8	901	C**G*****A*****G*****C**G*****C*****C*****G**C**A**G**C
SeqID11	961	CCCTATTACGAAGGGATTGCAATCTTAGGTAACACAGCAACCAACAAACCCCCCA
SeqID8	961	*****C**T**G**C*****C**C**G**C*****C*****G**C*****C*****C
SeqID11	1021	TCCTGCCTATCTACTCCGCAACAACTAACTATATCTGAAGTATCAGGGCAAGGAATG
SeqID8	1021	*****G**C**C**C**G*****G**G**C**C*****G**G**T**C**G**C*****
SeqID11	1081	TGCATAGGGAGTGTTCCTAAAACCCACAGGCTTTGTGCAATAAGACACACAGGGACAT
SeqID8	1081	*****C**A**G**C**G*****C*****C*****C*****C*****G*****C
SeqID11	1141	ACAGGGGCGCACTATCTAGCCGCCCAACGACCACTATTGGGCTGTAACTACTGGACTC
SeqID8	1141	*****C*****C**G**T*****T*****C*****C*****C*****A**C**G

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SeqID11 1201 ACCCCATGCATTTCATGGGCGGTGCTCAATTGGACCTCTGATTTTGTGTCCTTAATCGAA
SeqID8   1201 """"C""""C""""T""""G""C""""C""""G""C""T""G

SeqID11 1261 TTATGGCCAGAGTGACTTACCATCAACCGAATATGTGTACACACATTTGCCAAAGCT
SeqID8   1261 C"G""""G""""C""""C""G""T""G""""C""C""""G""

SeqID11 1321 GTCAGGTTCGAAGAGAACCAATATCACTAACGGTTGCCCTTATGTGGGAGGACTTACT
SeqID8   1321 ""G""""A"G""G""G""C""C""G""A""G""""G""C""G""C""G""A

SeqID11 1381 GTAGGGGCGATAGCCGCGGGGTCGGAACAGGGACTAAAGCCCTCCTTGAAACAGCCTGA
SeqID8   1381 ""G""""T""T""T""G""C""C""G""G""G""G""

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[illegible]

SeqID1	1200	CACCCCATGCATTTCCATGGCGGTGCTCAATTGGACCTTCGATTTTTTGTGCTTAATCGA
SeqID7	1200	G#####C#####T#####G#C#####C#C#####GC#G###
SeqID1	1260	ATTATGGCCCAGAGTGACTTACCATCAACCCGAATATGTGTACACACATTTGCCAAAGC
SeqID7	1260	C#G#####G#####C#G#####C#C#####G#
SeqID1	1320	TGTCAAGTTCCGAAGAGAACCAATATCACTAACGGTTCCTTATGTTGGGAGGACTTAC
SeqID7	1320	#####A#G#####C#C#####G#A#G#####G#C#####G#C#G##
SeqID1	1380	TGTAGGGGCGATAGCCCGGGGGTCCGGAACAGSGGACTAAAGCCCTCTTGAACAGCCCCA
SeqID7	1380	A#G#####T#T#T#####G#C#####C#C#G#####G#G#
SeqID1	1440	GTTCAGACAACATACAATGGCCATGCACACAGACATCCAGGCCCTAGAAGAACTCAATTAG
SeqID7	1440	#####G#####G#G###
SeqID1	1500	TGCCTTAGAAAAAGTCCCTGACCTCCCTTTCTGAGTAGTCTTACAAAACAGACGGGGCCT
SeqID7	1500	C#T#####A#####C#####C#####A#####
SeqID1	1560	AGATATCTTATTCTTACAAGAGGGAGGGCTCTGTGCCGATTGAAAGAAGATGTTTGCTT
SeqID7	1560	#####C#####A#####A#####A#####
SeqID1	1620	CTATGCGGATCACACCGGACTCGTCCGAGACATATGSCCAAATTAAAGAGAAGACTAA
SeqID7	1620	T#####T#A#####T#####T#####
SeqID1	1680	ACAGCGGCAACAACTGTTTGAAGTCTCCCAACAGGGATGGTTTGAAGGATGGTTCAACAAGTC
SeqID7	1680	#####
SeqID1	1740	CCCCTGGTTTACAACCCATAATTCTCTCAITATGGGCGCCCTTACTAATCCTACTCCTAAT
SeqID7	1740	#####T#####T#####G#
SeqID1	1800	TCTCCTCTTGGGCCATGCATCCTTAAACGATAGTACAAATCGTAAAGACAGAAATATC
SeqID7	1800	#####G#G#####
SeqID1	1860	TGTGTACAGGCTTTAATTTTAAACCAACAGTACCAACAGATAAAGCAATACGATCCGGA
SeqID7	1860	G#####A#C#G#####
SeqID1	1920	COGACCATGA
SeqID7	1920	#####